

providing a source of pseudo random acoustical noise to
an characterized external speaker source separate from the
5 portable communications device;

adjusting first coefficients in at least one digital
10 signal processor connected to the microphone for a desired
microphone frequency response based upon the input of pseudo
random acoustical noise;

15 applying the source of pseudo random acoustical noise
to an internal speaker source in the portable communications
device;

20 adjusting second coefficients in the at least one
digital signal processor for a desired internal speaker
frequency response based upon the input of the pseudo random
acoustical noise; and

utilizing a filter between the source of pseudo random
30 acoustical noise and the external speaker to compensate for
irregularities in the frequency response of the external
speaker.

3. A method of acoustic transducer calibration as in claim
1 further including the step of:

5 comparing the output of the at least one digital signal
processor with an optimal acoustic signal from the output
of the pseudo random acoustic noise to provide an error
signal for adjusting the coefficients of the at least one
digital signal processor.

10 4. A method of acoustic transducer calibration as in claim
1 wherein the source of pseudo random noise is from the
at least one digital signal processor.

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7. A method of acoustic transducer calibration for optimizing the frequency response and gain of a microphone located within a portable communication device comprising
- 5 the steps of:
- generating a source of acoustic pseudo random noise from at least one digital signal processor located in the portable communications device;
 - 10 providing the pseudo random noise to an external speaker;
 - directing the pseudo random noise from the external speaker to the microphone;
 - porting the output of the microphone to at least one digital signal processor;
 - 15 comparing the pseudo random noise with an output of the at least one digital signal processor; and
 - adjusting a plurality of coefficients in the at least one digital signal processor to produce an optimized microphone output for the portable communications device.
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1. *What is the main purpose of the study?*
 2. *What are the research objectives?*
 3. *What is the research methodology?*
 4. *What are the results of the study?*
 5. *What are the conclusions of the study?*
 6. *What are the limitations of the study?*
 7. *What are the implications of the study?*
 8. *What are the future research directions?*
 9. *What are the key findings of the study?*
 10. *What are the main contributions of the study?*
 11. *What are the strengths of the study?*
 12. *What are the weaknesses of the study?*
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